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Abstract

This study identified risk factors for lifetime marijuana use among 435 sixth- through twelfth-grade participants in a youth development program. Multivariate regression analysis revealed that modifiable risk factors, including smoking cigarettes and friends' substance use, were strongly associated with increased risk for lifetime marijuana use.

Keywords: Marijuana use; Risk factors; Youth development programs; Adolescents

Introduction

Marijuana use during the formative years of child development is particularly problematic due to the long-term, negative consequences. Previous research has shown that adolescents with a history of prior marijuana, tobacco, and/or alcohol use are at greater risk of progression toward any substance use disorder(s) [1]. Positive youth development programs may successfully prevent early initiation of drug use, thereby reducing the risk of adolescent substance abuse and dependence later in young adulthood [2]. These types of programs usually employ a combination of drug abuse prevention strategies, including social influence, skills training, and traditional education and information dissemination, to address modifiable risk factors. By identifying risk factors for adolescent marijuana use that are amenable to change, it is possible for positive youth development programs to reduce the risk of marijuana use among young people.

This study assessed the relationship between drug-related attitudes, drug knowledge, psychosocial characteristics, and self-reported drug use among sixth- through twelfth-grade boys and girls in a unique, military-sponsored youth development program that promotes a healthy, drug-free lifestyle.

Methods

Ninety community-based programs across the United States were targeted for study recruitment using a random sampling procedure. This study protocol was approved for research involving human subjects by the Naval Health Research Center Institutional Review Board (protocol NHRC.2007.0029). Upon receiving written consent to participate, paper surveys, as well as password-protected Internet-based surveys, were administered to the youth. Lifetime

marijuana use was defined by a survey question that asked, “On how many occasions (if any) have you used marijuana in your lifetime?” The demographic variables grade, race, and time in program were categorized into three or four levels, and all other independent variables were dichotomized. Univariate and multivariate logistic regressions were used to assess the associations between lifetime marijuana use and risk factors measured by the survey including: demographics, drug knowledge, cigarette smoking, alcohol use, access to marijuana and alcohol, disapproval of substance use, friends’ substance use, perceived harm from substance use, and other psychosocial characteristics. Odds ratios (OR) and 95% confidence intervals (CI) were first calculated for each variable of interest independently. Then, a multivariate model was constructed based on significant unadjusted associations. Regression diagnostics were used to evaluate correlations and variance inflation factors, and the overall model was assessed with the Hosmer-Lemeshow goodness-of-fit test. Statistical analyses were performed using SPSS software, Rel. 17.0.0, 2008 (SPSS, Inc., Chicago, IL).

Results

A total of 54 out of 90 targeted youth programs participated, for an overall program response rate of 60.0%. Five hundred fourteen youth surveys were collected from 657 individuals invited to participate, resulting in a 78.2% individual response rate. However, 79 surveys were excluded due to missing outcome data, leaving 435 surveys for risk factor analysis. Univariate logistic regression analysis of 18 potential risk factors revealed 9 variables with significant unadjusted associations with lifetime marijuana use. When considering the independent effect of each potential risk factor, the variable with the strongest association with marijuana use was “ever smoked cigarettes,” or lifetime cigarette use (OR = 30.17). After

adjusting for the effects of all of the other variables in the multivariate model, lifetime cigarette use remained the risk factor most strongly associated with lifetime marijuana use (OR = 19.69) (Table 1). This result indicates that having ever smoked cigarettes greatly increased the risk of lifetime marijuana use. The multivariate model also revealed reporting that most or all of one's friends use substances, such as cigarettes, marijuana, alcohol, or cocaine (OR = 5.03), was a significant predictor of lifetime marijuana use.

Discussion

The multivariate analysis identified modifiable risk factors that were strongly associated with lifetime marijuana use among youth participants. A prior history of cigarette smoking was significantly associated with marijuana use. Similar associations have been found in previous studies [3–5]. The common method of use, via inhalation, is hypothesized by Agrawal and Lynskey [3] to have an important role in co-occurring use of both tobacco and marijuana, and therefore represents an area for education and intervention. Having friends who use substances, such as cigarettes, marijuana, alcohol, or cocaine, was also significantly associated with marijuana use. Personal drug-use behaviors are influenced by peer pressure from friends who use drugs and by spending time with those friends; likewise, peer pressure has often been cited as a common risk factor of drug use [6]. Teaching youth peer-pressure coping skills and exposing them to positive developmental environments may reduce marijuana use among adolescents. This study found that prior cigarette use and the influence of friends' substance use were more important risk factors for marijuana use than other common factors, such as access to drugs and perceived risk of harm from drug use, among this sample of youth development program participants. These results indicate that having ever smoked cigarettes and having friends who

use substances greatly increased the risk of lifetime marijuana use. However, the wide confidence intervals for these correlates, which are likely a consequence of low frequencies of these variables, indicate that caution should be used when interpreting these results.

Study strengths included the use of a random sampling procedure and validated survey measures used extensively in previous research. Limitations of this research were the use of cross-sectional data, self-reported measures of drug use, and the statistical limitations imposed by a small sample size and the low frequency of some variables. Despite these limitations, this study presents evidence for modifiable social and behavioral risk factors for adolescent marijuana use, which could be influenced by targeted substance abuse prevention efforts.

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Table 1

Logistic regression of risk factors for lifetime marijuana use among adolescents in a youth development program

Variable	OR ^a	95% CI
Grade		
6th–8th (reference)	—	—
9th–10th	0.82	0.35-1.94
11th–12th	1.09	0.36-3.29
Race		
Black (reference)	—	—
White	0.7	0.20-2.41
Hispanic	1.05	0.28-4.00
Other ^b	6.43	0.76-54.72
Gender (female)	1.83	0.75-4.45
Time in program		
≤6 months (reference)	—	—
1–2 years	0.39	0.14-1.09
>2 years	0.73	0.31-1.70
Access to alcohol or marijuana (easy to get) ^c	2.43	0.90-6.56
Ever smoked cigarettes (yes)	19.69 [*]	8.54-45.38
Self-efficacy (low score) ^d	2.01	0.95-4.26
Perceived risk of harm from any substance use (low) ^e	0.84	0.22-3.18
Friends who use any substance (most/all) ^f	5.03 [*]	2.30-10.97

Note: OR = odds ratio; CI = confidence interval.

N = 435.

^{*} $p \leq .001$.

^aOdds ratios were adjusted for all variables in the model.

^bOther race includes Asian, American Indian or Alaskan native, or native Hawaiian or other Pacific Islander.

^cResponse categories: Easy to get, Difficult to get (reference).

^dResponse categories: Low score, High score (reference).

^eResponse categories: Low, High (reference).

^fResponse categories: Most/all, Some/none (reference).

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